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HOUSE ARMED SERVICES COMMITTEE
TACTICAL AIR AND LAND FORCES
SUBCOMMITTEE

STATEMENT OF

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BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

FY 2006 NAVY UAV AND J-UCAS PROGRAMS

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Mr. Chairman, Congressman Abercrombie, distinguished members of the Subcommittee, thank you for this opportunity to appear before you to discuss the Department of the Navy's Fiscal Year (FY) 2006 Acquisition and RDT&E Unmanned Aerial Vehicle (UAV) programs. BGEN Post, USMC, is with me today on behalf of the Department of the Navy.

Your Navy / Marine Corps Team continues to prosecute the Global War on Terrorism (GWOT) with significant involvement in Operations ENDURING FREEDOM (OEF) and IRAQI FREEDOM (OIF). These efforts are reflective of the substantive return on your investment in our combat readiness, our people, and our unique maritime warfighting capabilities. These investments clearly demonstrate the latest technologies in surveillance, command and control and persistent attack as our forces operate from sovereign U.S. territory and exploit the vast maneuver space provided by the sea.

The Marine Corps was the first Service to employ UAVs in combat during Operation DESERT STORM. The Navy also flew UAVs during Operation DESERT STORM. Although the Navy has subsequently transferred their operational Pioneer UAV systems to the Marine Corps they still continue to support USMC Pioneer efforts with one Pioneer system used for Test and Evaluation and one Pioneer system used for training. There are plans to acquire new UAVs – Fire Scout to provide Littoral Combat Ship an organic UAV capability in 2008 and Broad Area Maritime Surveillance UAV to provide a worldwide access, persistent maritime ISR capability in 2013. This year the Navy is taking delivery of two Global Hawk UAVs, procured in concert with the Air Force's production, for a Maritime Demonstration program. The Navy also operates one Predator system for the United States Joint Forces Command's Joint Operational Test Bed System (JOTBS) to examine UAV interoperability.

The Marine Corps' operational UAV systems include the tactical Pioneer UAV and the back pack-able Dragon Eye UAV. Today, both are operating in support of OIF. The Marine Corps is also operating two Scan Eagle UAV systems under a fee-for-service agreement in support of Marine Expeditionary Forces in OIF. The Marine Corps is developing requirements for the Vertical UAV in consonance with Ship to Objective Maneuver concepts from Expeditionary Maneuver Warfare and Sea Power 21 and is also procuring the Eagle Eye UAV, developed by the United States Coast Guard in connection with its Deepwater Program, for evaluation.

The GWOT, OEF and OIF continue to demonstrate the enormous contributions that UAVs make to the effectiveness of joint and coalition forces. UAVs support and enhance both surveillance and strike missions with persistent, distributed, netted sensors. UAVs have played a critical role in recent operations

and are also a key element of our transformation. The UAV systems we are pursuing in our Naval Power 21 vision will greatly enhance our war fighting concepts and capabilities.

UNMANNED AERIAL VEHICLES (UAV) PROGRAMS

DoN has two fielded UAV systems – Pioneer UAV and Dragon Eye UAV. Pioneer has flown over 7500 hours in support of Operation Iraqi Freedom (OIF) and 35 of 41 production Dragon Eye systems are deployed in support of OIF, highlighting the criticality of these systems for our Marine forces. Department is investing in 4 classes of UAVs.

Small UAVs

Dragon Eye - The Dragon Eye UAV Milestone C completed in Fall 2003 and was followed by production contract award. This system achieved IOC in June 2004.

Tactical UAVs

Pioneer UAV Program - The Fiscal Year 2006 Budget requests \$1.9M to continue Pioneer UAV Sustainment Program. The Pioneer UAV System provides tactical commanders with day and night, battlefield and maritime intelligence, reconnaissance, surveillance, and target acquisition in support of Marine expeditionary warfare and maritime control operations. The Pioneer sustainment plan includes the technology refresh necessary to ensure the viability of Pioneer for the Marine Corps. This effort consists of incorporating new payloads, launchers and corrections for obsolescence issues to sustain the Pioneer UAV until a replacement is fielded. The Pioneer program is using major sub-systems from the Army's Shadow 200 and Hunter UAV systems to minimize Life Cycle Cost, i.e. the engine, payload, Ground Control Station, and launcher from Shadow and the Flight Computer and avionics package from Hunter.

Vertical Takeoff and Landing Tactical UAV (VTUAV) - Fire Scout - The Fiscal Year 2006 Budget requests \$77.6M to continue development of the Fire Scout UAV. The Fire Scout is a Vertical Takeoff and Landing Tactical UAV (VTUAV) designed to operate from all air-capable ships, carry modular mission payloads, and operate using the Tactical Control System (TCS) and Tactical Common Data Link (TCDL). The Fire Scout UAV will provide day/night real time ISR and targeting as well as communication-relay and battlefield management capabilities to support core Littoral Combat Ship (LCS) mission areas of ASW, MIW and ASUW for the Naval forces. Upgrades will include a four-bladed rotor and increased payload capacity. Upgraded Fire Scout capability will be fielded with LCS Flt 0.

The Army has selected the Fire Scout air vehicle for their Army Future Combat System Class IV UAV. Numerous similarities in hardware components, testing, logistics, training, software and support requirements offer potential for overall program cost reduction which would clearly benefit both the Army and Navy. We expect to sign a Memorandum of Agreement with the Army for the acquisition of the Fire Scout airframe, and selected subsystems on a single Navy contract. The airframes will be subsequently modified to Service-specific requirements under separate existing Navy and Army contracts. The goal is to maximize common support opportunities, eliminate redundant costs, maximize common avionics and sensor configuration to promote interoperability, and eliminate redundant tests.

Vertical Unmanned Air Vehicle (VUAV) - Eagle Eye - The Marine Corps is pursuing the replacement of its almost 20-year-old Pioneer UAV system that has flown over 7500 hours in support of OIF highlighting the criticality of these systems for our Marine forces. Requirements for VUAV are being developed in consonance with Ship to Objective Maneuver concepts from Expeditionary Maneuver Warfare, the Naval concepts of Sea Basing and Seapower 21, and with lessons learned from recent operational experience. The Fiscal Year 2006 Budget requests \$9.2M to evaluate the Eagle Eye UAV, currently being developed by the United States Coast Guard in connection with its Deepwater Program. Eagle Eye is being used to refine the VUAV concepts of Operation. Additionally, our intended procurement of a common Army, Coast Guard and Marine Corps UAV ground control station will also enhance cost efficiency.

Tactical Control System (TCS) - The Fiscal Year 2006 Budget requests \$10.9M to continue TCS development. TCS provides interoperability and commonality for mission planning, command and control, and C4I interfaces for Tactical and Medium Altitude UAVs. The TCS program continues development of an architecture that will include a standards-based implementation using the NATO STANAG 4586 for UAV interoperability, Fire Scout functionality and integration with LCS, and Plug and Play Payload capability. TCS currently flies Fire Scout and Navy Predators with Joint Forces Command's Joint Operational Test Bed System GCS. The TCS program restructure directed by FY 2004 Congressional language has been completed; it is meeting standards-based interoperability through implementation of NATO Standards Agreement (STANAG) 4586, and supporting requirements for Fire Scout and LCS.

Long Dwell Maritime Surveillance UAV

Global Hawk Maritime Demonstration System - The Fiscal Year 2006 Budget requests \$18.9M in O&M,N funding to support fleet battle experiments and CONOPS development with 2 Global Hawk UAVs the Navy procured in FY03 in concert with the Air Force's production. For the GHMD program, the Global Hawk Integrated Sensor System (ISS) radar software is being modified to provide

inverse synthetic aperture radar (ISAR) and maritime moving target indicator (MMTI) modes that provide capabilities in a maritime environment.

Broad Area Maritime Surveillance (BAMS) UAV - BAMS UAV will provide a persistent, worldwide access, multi-sensor, maritime Intelligence, Surveillance and Reconnaissance (ISR) capability in support of Sea Shield and is a key system, along with the Multi-mission Maritime Aircraft (MMA) and Aerial Common Sensor (ACS), to recapitalize the Navy's airborne ISR fleet. The BAMS UAV program is now scheduled for a Milestone B review and approval in fourth quarter FY07 leading to an IOC in late FY 2013.

Sea Based Penetrating Surveillance

Joint Unmanned Combat Air System (JUCAS) - The Fiscal Year 2006 Budget realigns funding to the Air Force to establish a Joint Program Office with Navy representation to advance the JUCAS Program. The Department is committed to a JUCAS initiative, developed in partnership with the Air Force and DARPA. The Navy and the Air Force have defined a set of capabilities, which recognizes the unique needs of each Service that will form the basis for developing air vehicles and that will contribute to a joint warfighting concept of operation.

CONCEPT OF EMPLOYMENT

The Marine Corps's concept of UAV support is divided into three tiers which coincide with the level of unit they support. The Marine Corps' Tier-I UAV, Dragon Eye, is being flown at the Battalion and below level. The Marine Corps flew ten systems in an operational test during Operation Iraqi Freedom I (OIF-I), and have deployed 35 systems to units in Iraq for OIF-II and OIF-III. These UAVs are meant for the small unit and its video is not available beyond the user.

The Marine Corps' Tier-III UAV is Pioneer. Its employment concept is to support all taskings from the Marine Expeditionary Force (MEF). For the most part, the Unmanned Aerial Vehicle Squadron that employs the Pioneer UAV system supports the MEF's subordinate units. The most common support is to provide intelligence, surveillance, reconnaissance and target acquisition to our ground combat element. This includes direct support to our Marine Division and Regiments. Additionally, when Army and coalition units have been assigned to the MEF, these units have also received Pioneer UAV support.

Within the Joint context, the UAV Squadron and its Pioneer platform provides near-real time video and annotated digital photos of targets and areas of interest to all units within the MEF area of operations, including the Army and

coalition forces. In addition, the UAV Squadron provides immediate description of targets, areas of interest and activities with an Internet chat capability. Another capability provided by the Squadron is that it sends out teams with the Manpack Receive Stations (MRSs). These MRSs receive video from the Pioneer and also from our Litening Pod-equipped manned aircraft, the F/A-18 and AV-8. These MRS Teams have supported Marines and Soldiers in Operation Iraqi Freedom (OIF).

The Marine Corps' recent acquisition of Receive-Only Video Enhanced Receiver (ROVER) III will greatly enhance our interoperability with other Services' UAVs. The ROVER III can receive video from UAVs, such as the Air Force's Predator, the Army's Shadow, as well as our own Pioneer and Litening Pod equipped manned aircraft. The Marine Corps procured 36 Rover III systems. Five systems are currently deployed in Iraq with the additional systems deploying later this spring.

The Marine Corps has contracted for Scan Eagle UAV services to support OIF. This UAV is usually tasked to support our Regiments. Scan Eagle is not a program of record but fills an identifiable niche. The Marine Corps is developing requirements for a UAV to support Regimental and Marine Expeditionary Unit operations. This Tier-II UAV will be smaller than our Tier-III Pioneer but bigger than our Tier-I UAV, the Dragon Eye.

Marine Corps future employment concepts and requirements are being developed. The new UAV, the Vertical UAV (VUAV) will provide responsive, real-time reconnaissance, surveillance, intelligence, targeting and weapons employment capability to the Marine Air Ground Task Force and Joint Task Force Commanders in support of Expeditionary Maneuver Warfare (EMW). It will have key attributes of expeditionary capabilities (i.e. vertical take off and land), speed and survivability. These key attributes and capabilities will support the concepts of not only EMW but also Sea Power 21. The VUAV will be controlled by ground control stations and by manned-unmanned teaming from inside our MV-22s. The VUAV will use the Tactical Common Data Link (TCDL) increasing interoperability with other Services. Like Pioneer, the VUAV will continue to provide the video, photos, and information on targets and areas of interest to other Services through the global information grid. The VUAV will have plug and play payloads including radio relay, signals intelligence, and Nuclear, Chemical and Biological detection. Additionally, it is an objective to have the VUAV carry weapons.

Navy employment concepts and requirements are being developed as well. The overarching concept is to develop UAV systems that fill an identified capability gap and improve the war fighting capability of the joint forces.

Interoperability will tie the different systems together. BAMS UAV will provide persistent maritime ISR and operate as an adjunct to MMA. Fire Scout provides LCS with ISR, Targeting, and Communications relay to other off board LCS systems. JUCAS provides ISR in the battlespace in which Carrier Strike aircraft operate.

OPERATIONAL EXPERIENCE

Pioneer UAV

Since it was first acquired in 1986, the Pioneer's mission is to conduct reconnaissance, surveillance and target acquisition for the Marine Air Ground Task Force (MAGTF) commander. Today 26% of the air vehicles (9 of 35) and two of the nine ground control stations (GCSs) in the USMC inventory are supporting OIF-II/III operations. Pioneer has flown over 7,500 hours in support of OIF actions. VMUs operating Pioneer have flown beyond peacetime flight hours by nearly 800%. Yearly, the Pioneer fleet is flying 400% more than in peacetime and OIF hours have accounted for over 20% of the total Pioneer flight hours since the program's start.

The VMUs average four sorties a day covering a 16-hour window. However, during the first eleven days of the Fallujah operation, the VMU flew 24 hours a day. Pioneers are flying 51% of their sorties in the day and 49% at night testament to the effectiveness of Pioneer's POP-200 EO/IR camera. VMU-1, during its last deployment, supported Marines 61% of the time, Army units 31% of the time, and others 8%. VMUs push their Manpack Receive Stations (MRS), laptops capable of receiving Pioneer and Litening Pod video, out to supported units increasing coordination and decreasing time to engage targets. VMU Squadrons cross many traditional boundaries due to their specific mission and sensor payloads. From August 2004 to February 2005, VMU-1 serviced over 5501 targets, produced 2,356 imagery products, and supported 103 BHA/BDA missions acting as an intelligence platform and coordinated 30 strike missions and adjusted fires 29 times serving as an operational platform.

In spite of the increased flight hours, Pioneer incident and strike rates continue to fall. During the eight months of OIF-I, there were 23 incidents, including five strikes making for an incident for every 102.5 hours and strike per every 471.6 flight hours. During the past 12 months of OIF-II, Pioneer has had six incidents including one strike for an incident per every 866 flight hours and a strike for every 5,196 flight hours. Factoring in material solutions like spark plug gaps, increased inspections and lesson learned, the VMUs have increased their flight hours by 220% and decreased the incident rate by 845% and strike rate by 1101%. Further, the specific causal factors for incidents have fallen. Operator error accounted for 50% of the OIF-I incidents and only 36% of OIF-II incidents.

Further, engine cuts were the largest mechanical causal factor accounting for 79% of the OIF-I incidents but those have been cut to 57% of the OIF-II incident causal factors.

Dragon Eye

Dragon Eye's mission is to provide the small unit commander a simple, cost effective day/night point reconnaissance and surveillance sensor that does not impact manpower. Dragon Eye began fielding in June 2004, after a successful 10-system demonstration with the 1st Marine Division serving in Iraq. Currently, over 85% of the Dragon Eye inventory (101 air vehicles and 35 Ground Control Stations (GCS)) are serving in Operation Iraqi Freedom. As of November 2004, they had flown 3,500 hours. Today, the average system, composed of three air vehicles and one GCS, is flying three to five times a day with each sortie averaging 10-45 minutes. The battery powered air vehicles fly with one electro-optical (EO), low light level (LLL), or infrared camera depending upon the prevailing conditions. Dragon Eye UAVs are flying 60% of their sorties during the day and 40% at night.

Two Marines assemble and launch the Dragon Eye UAV by using a bungee cord in less than ten minutes. Controlled autonomously via an L-Band data link and by GPS, Dragon Eye has been indispensable in providing an "over the next hill, around the next bend" awareness for Battalion and Company Commanders. The air vehicles can land on improved and unimproved surfaces. As of January 2005, 22 Dragon Eyes had been lost. Eleven air vehicles have been suspected of being lost to combat, six to operator error, three to flying beyond the operational envelope and two suffered from GPS issues that had not been discovered during operational and developmental testing.

STANDARDS-BASED INTEROPERABILITY

A standards-based approach is being taken for TCS developments for command and control of Navy UAVs. TCS was initially required to be both interoperable and common, and the Navy still desires and strives for these attributes. TCS will develop and implement a standards-based interoperability solution that will build on the current TCS modular, scalable, and open system architecture design to include implementing a Naval approved technical standard for datalink and C4I interfaces utilizing NATO Standardization Agreement (STANAG) 4586. This agreement, which was recently ratified by nine member nations of NATO, will form the basis for future TCS architectures. This builds upon other existing aspects of UAV systems that have developed standards, such as those for imagery and data links. The underlying purpose is to function as a

key enabler, promote a common operational picture, and provide the ability to take advantage of available resources.

In the past the focus on interoperability has been between data link terminals on the specific airborne collection platform and its related receiving station. However, the true value of interoperability occurs when the requirement is extended to encompass everything between the sensor on the collection platform and the display on the receiving station on multiple collection platform and receiving station types. This sensor-to-display or "end-to-end" interoperability is addressed in compatible data links, standardized framing of data, and interoperability outside of the data link, including common sensor data formats. The Navy has developed a common Configuration Profile for End-to-End Interoperability among Naval CDL Systems with the objective to assure interoperability through a common mode of operation, and to provide guidance to buyers of Naval CDL systems and other Services that require assurance of interoperability with Naval CDL systems. It is this configuration that allows true end-to-end, cross-vender interoperability between ISR platforms. The DoN is implementing this common approach on our new UAV programs – Fire Scout and BAMS, as well as manned aircraft including Multi-mission Maritime Aircraft (MMA), SH-60R, and P3-AIP.

The DoN focus of the standards-based interoperability encompasses ground, air and C4I functional elements. It is intended to be a scalable scheme with the ability to implement at the platform level based on the desired level of interoperability. Interoperability enhances capability, flexibility and results in a Common Operational Picture (COP).

SUMMARY

The DoN is making positive progress in developing and fielding UAV systems. UAVs will play an even greater role in future operations and are a key element of our transformation. We will continue to refine our UAV operational concepts and appropriate technology investments to deliver the kind of dominant military power from the sea envisioned in Sea Power 21. We look forward to the future from a strong partnership with Congress that has brought the Navy and Marine Corps Team many successes today. We thank you for your consideration.